

We Claim:

1. A method for selectively oxidizing a metallization structure having at least one silicon layer to be oxidized and at least one tungsten layer which is not to be oxidized, which comprises the steps of:

performing a treatment step which includes subjecting the metallization structure to a mixture of hydrogen and water and supplying heat; and

subjecting the metallization structure to a nonaqueous hydrogen-containing substance, before and, optionally, after the treatment step.

2. The method according to claim 1, which further comprises during a first section of treatment with the nonaqueous hydrogen-containing substance before the treatment step, setting a supply of the heat such that a temperature of the metallization structure is increased from a first temperature to a second temperature.

3. The method according to claim 2, which further comprises during the treatment step, setting a supply of the heat such that a temperature of the metallization structure is increased from the second temperature to a third temperature.

4. The method according to claim 3, which further comprises during a second section of the treatment with the nonaqueous hydrogen-containing substance after performance of the treatment step, setting the supply of the heat such that the temperature of the metallization structure is reduced continuously from the third temperature to the first temperature.

5. The method according to claim 1, which further comprises setting a water content of the mixture to be below 20% for a duration of the treatment step.

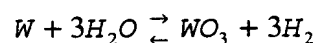
6. The method according to claim 2, which further comprises setting the first temperature to be higher than room temperature and lower than 200° C.

7. The method according to claim 2, which further comprises setting the second temperature to lie in a range from 700° C - 900° C.

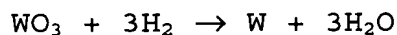
8. The method according to claim 1, which further comprises at least during one section of the treatment step, setting a supply of the heat such that a temperature at or in an immediate vicinity of the metallization structure is in a range from 900° C - 1100° C.

9. The method according to claim 1, which further comprises treating the metallization structure with an inert gas before and, optionally, after it has been subjected to the nonaqueous hydrogen-containing substance.

10. The method according to claim 1, which further comprises during the treatment step, selecting a water content and a temperature such that in a pair of reaction equations



the reaction equation



has a greater reaction rate.

11. The method according to claim 1, which further comprises: carrying out the performing and subjecting steps in a reaction chamber which has an inlet opening and an outlet opening; and disposing a substrate which includes the metallization structure in the reaction chamber such that process gases can

flow past the substrate from the inlet opening to the outlet opening.

12. The method according to claim 1, which further comprises carrying out the subjecting and performing steps in a conditioning device.

13. The method according to claim 1, which further comprises carrying out the subjecting and performing steps in a conditioning device selected from the group consisting of a lamp-heated rapid thermal processing device and a rapid thermal annealing device.

14. The method according to claim 1, which further comprises selecting one of pure hydrogen and a hydrogen/inert gas mixture as the nonaqueous hydrogen-containing substance.

15. The method according to claim 2, which further comprises during the treatment step, setting a supply of the heat such that a temperature of the metallization structure is increased from a defined temperature to a process temperature.

16. The method according to claim 15, which further comprises during a second section of the treatment with the nonaqueous hydrogen-containing substance after performance of the treatment step, setting the supply of the heat such that the

temperature of the metallization structure is reduced continuously from the process temperature to a lower temperature.

17. A method for selectively oxidizing a metallization structure being a gate structure having at least one polycrystalline silicon layer to be oxidized and at least one tungsten layer which is not to be oxidized, which comprises the steps of:

performing a treatment step which includes subjecting the metallization structure to a mixture of hydrogen and water and supplying heat; and

subjecting the metallization structure to a nonaqueous hydrogen-containing substance, before and, optionally, after the treatment step.

18. A method for fabricating a metallization structure having at least one silicon layer and at least one tungsten layer, which comprises the steps of:

performing a treatment step which includes subjecting the metallization structure to a mixture of hydrogen and water and supplying heat; and

subjecting the metallization structure to a nonaqueous hydrogen-containing substance, before and, optionally, after the treatment step.

19. A method for fabricating a gate structure of a MOS component having at least one polycrystalline silicon layer and at least one tungsten layer, which comprises the steps of:

performing a treatment step which includes subjecting the gate structure to a mixture of hydrogen and water and supplying heat; and

subjecting the gate structure to a nonaqueous hydrogen-containing substance, before and, optionally, after the treatment step.